



# Mech Family



كن أنت التغيير

اللجنة الأكاديمية في قسم

الهندسة الميكانيكية

# MATLAB

# Midterm

# Exam Spring

# 2026

كن أنت التغيير  
اللجنة الأكاديمية في قسم الميكانيكا  
الميكانيكية

1) what does who's do? one of the options(the correct one) was who's does not show the values of the variables only their sizes

2)Plot the equation  $PV=mRT$  where  $R=8.314$   
 $V=34.5$  ,  $m=12$

3)write a vector (v) which starts with  $5-2i$  and ends with  $5+2i$  and contains 20 elements

4) solve the linear system of equations

$$u+v+x+y=1$$

$$u+v+x+z=8$$

$$u+v+y+z=3$$

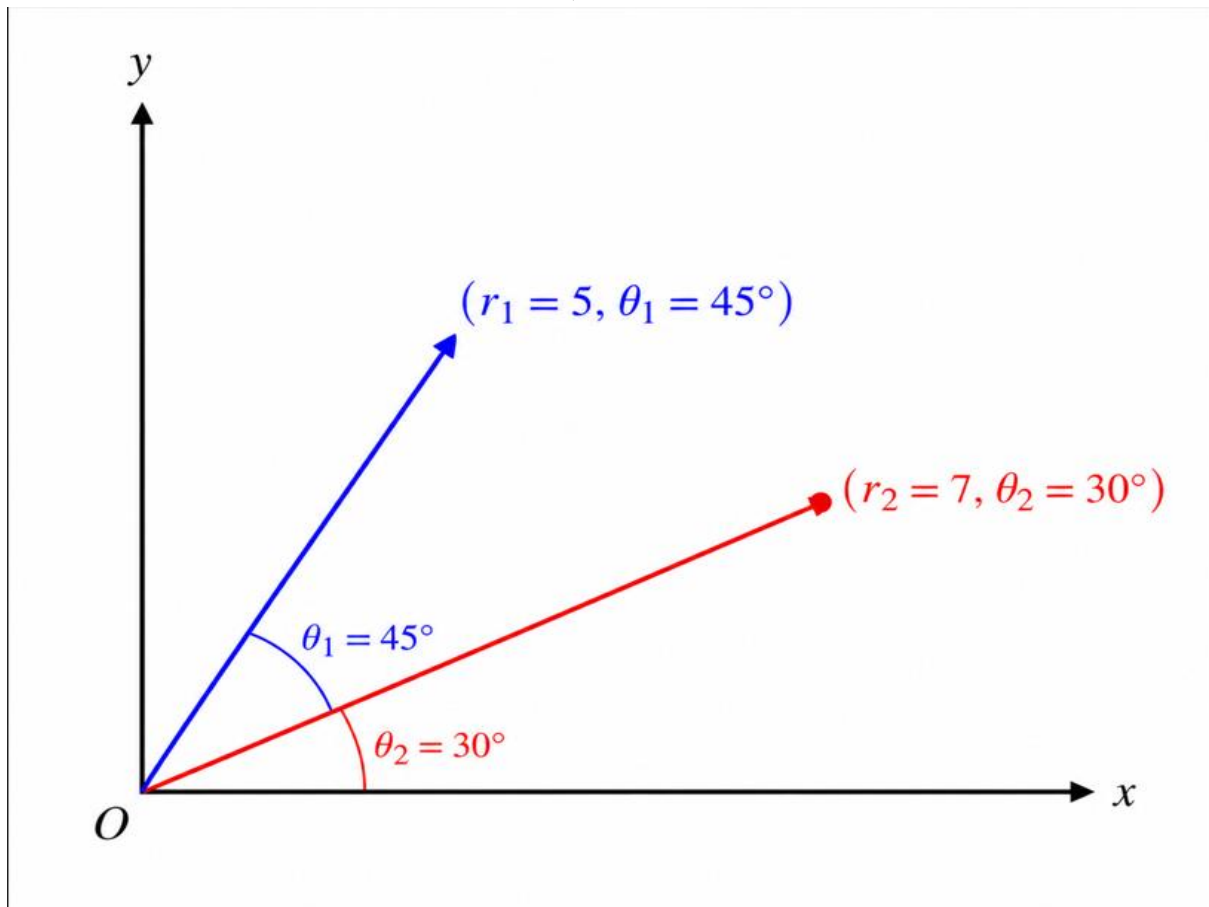
$$u+x+y+z=2$$

$$v+x+y+z=-2$$

5) define  $x=[2,3,-1]$  and  $y=[3,-2,1]$  and compute the average of z where

$$z = \frac{e^{x^2} \cos(x^2)}{\sin(x^3 e^x)}$$

6) write a function that computes the vector sum of two vectors the function name is `AddVector(r1,th1,r2,th2)` using polar coordinates and use this function to compute the sum of the following vectors shown: (hint: use  $r_x$  ,  $r_y$  , to compute the magnitude and angle of resultant vector)



7) Define a function that finds the sum of the diagonal of any random matrix

8) create a 7x7 matrix all of its elements are zeros and make the first and fourth rows elements twos

9) define a vector  $a=[8,2,-4,-10]$  and apply operations to obtain

a)  $v=[0,-6,-12,-18]$

b)  $q=[1,1,1,1]$

10) find the derivative of the following polynomial

$$f(x) = x^4 - x^2 + 3x - 1$$

11) find the multiplication of the polynomials

$$f(x) = x^3 - 2x^2 + 3x - 4, \quad g(x) = 3x^2 - 2x - 2$$

12) define a function  $S = 3x - 2y$

And use it to compute  $S(5,-3)$

(use handle function)